

Grambling State University
Department of Chemistry
Organic & Biological Chemistry
CHEM 106

PROFESSOR:

OFFICE:

TELEPHONE:

EMAIL:

OFFICE HOURS:

Appointments also available.

APPOINTMENTS: Appointments office hours may be made by contacting the instructor. For subsequent cancellations please notify the instructor at least one day in advance.

ATTENDANCE: More than six (6) absences can result in a failing grade for this course.

CLASSROOM RULES: There will be **NO** food, drinks, or tobacco products allowed in the classroom. Please refrain from using any recording devices in the classroom. As common courtesy dictates, please do not wear caps/hats/headgear in the classroom. Likewise, absolutely **NO** cellular phones/pagers will be allowed. The use of cell phones (including texting) and pagers will result in dismissal from the classroom and student will not be allowed to participate in any unfinished activity for that day.

COURSE PREREQUISITE(S): These are determined by the student's degree program plan of study and with the advice of their advisor. Students should consult their advisors prior to enrolling in this course.

NUMBER OF HOURS OF COURSE: Three (3) credit hours

NATURE OF COURSE: Required _____ Non-required _____

NATURE OF STUDENTS: Graduate _____ Undergraduate ✓_____

COURSE DESCRIPTION/OVERVIEW: This course is designed for nursing students to gain an understanding of organic substances. Students will learn the structures, nomenclature, and the physical and chemical properties of organic compounds. In addition, students will learn how these organic molecules work within biological systems.

COURSE GOALS/COMPETENCIES: Upon completion of this course the student will be able to understand: (a) how to draw organic molecules; (b) IUPAC nomenclature; (c) stereochemistry and isomerism of a compound; (d) protein chemistry; (e) fats and oils; (f) carbohydrates chemistry; (g) vitamins; (h) hormones; (i) steroids; and (j) chemical communication in biological systems.

REQUIRED TEXTS: F.A. Bettelheim, W.H. Brown, M.K. Campbell, and S.O. Farrell, General, Organic, and Biochemistry, 8th ed., Thompson, 2007. ISBN-13: 987-0-495-01197-2. ISBN-10: 0-495-01197-5.

RECOMMENDED/ OPTIONAL/ SUPPLEMENTARY TEXTS: n/a.

- COURSE CONTENT:**
1. Organic Compounds
 - Organic and inorganic substances
 - Hybridization of Carbon Atom
 - Bond Formation by Atomic Orbitals
 - Aliphatic and Aromatic Hydrocarbons
 - IUPAC Nomenclature System
 - Isomerism
 - Kekule's Structure Theory
 - Conformation of Alkanes
 - Cycloalkanes
 - Physical and Chemical Properties of Alkenes
 2. Unsaturated Hydrocarbons
 - Nature of Carbon-Carbon Double Bond
 - Nomenclature of Alkenes and Alkynes
 - Geometric Isomerism
 - Aromatic Compounds and Benzene Structure
 - Benzene Derivatives and Poly Aromatic Hydrocarbons
 - Polymer and Alkenes
 3. Alcohols, Phenols and Ethers
 - Nomenclature of Alcohols, Phenol and Ethers
 - Classification of Alcohols
 - Physical and Chemical Properties of Alcohols, Phenol and Ethers
 - Ethers and Anesthetics
 4. Aldehydes and Ketones
 - Nomenclature of Aldehydes and Ketones by IUPAC
 - The Nature of Carbonyl Group and Its Reactions
 - Physical and Chemical Properties
 - Important Aldehydes and Ketones: Hormones and Birth Control
 5. Carboxylic Acids and Esters
 - Nomenclature of Carboxylic Acids
 - Activity of Carboxylic Acids
 - Formation of Esters With Alcohols
 - Nomenclature of Esters
 - Saponification
 - Reactions of Carboxylic Acids and Esters
 6. Amines and Amides
 - Classification of Amines
 - Nomenclature of Amines
 - Basicity of Amines
 - Biologically Important Amines
 - Nomenclature of Amides
 - Physical and Chemical Properties of Amines and Amides

7. Carbohydrates

- Classification of Carbohydrates
- Stereochemistry and Fisher Projection
- Important Mono, Di, and Polysaccharides
- Health Effects of Sucrose
- Fiber and Good Health

8. Lipids

- Classification of Lipids
- Fatty Acids and Oils
- Chemical Properties of Fats and Oils
- Biological Membranes
- Steroids, Hormones
- Prostaglandins local Hormones

9. Proteins

- Amino Acids and Essential Amino Acids
- Reaction of Amino Acids
- Important Peptides
- Primary, Secondary, and Tertiary Structures of Proteins
- Protein Hydrolysis and Denaturation

10. Enzymes

- The Nature of Enzymes
- Enzymes Nomenclature and Classification
- Enzymes Cofactors
- Mechanism of Enzymes Action
- Enzymes Activity
- Factors Affecting Enzymes Activity
- Medical Application of Enzymes/Enzymes to Dissolve Blood Clots)

11. Chemical Communication

- The Nature of Neurons
- Hormones and Steroids
- Important Neuro-transmitters

TEACHING TECHNIQUES/METHODS USED IN COURSE: Lectures, multiple choice/short answer tests and quizzes, discussions, pre-class reading assignments and problem solving homework.

ASSESSMENTS USED: Quizzes, a mid-term, and a final examination are given each semester. **Each student must present a valid university ID during the administration of quizzes and examinations.**

GRADE EVALUATION: A (90-100%), B (80-89%), C (70-79%), D (60-69%), F (< 60%).

EXAM. MAKE-UP POLICY: A strict make-up policy is enforced. On rare instances, make-ups will be permitted, but must be based on valid emergencies and will be handled through the instructor.

LABORATORY REQUIREMENTS: This course must be accompanied by laboratory course CHEM 108.

DISABILITY STATEMENT: Students with disabilities who seek reasonable accommodations in the classroom or other aspects of performing their coursework must first register with the GSU Counseling Center located in Foster-Johnson Health Center. Staff members at the Counseling Center will work with students to obtain the required disability documentation, and to identify appropriate accommodations as required by applicable disability laws including the Americans with Disabilities Act (ADA). After receiving all necessary documentation, their staff will then determine whether a student qualifies for services with the Center and if so, the accommodations for the student will be provided. The staff then prepares a letter for the student to provide to their professors advising them of approved accommodations. For further information, contact the Counseling Center ADA office at (318) 274-3338.

ACADEMIC HONESTY STATEMENT: Students are expected to adhere to the highest standards of academic honesty as outlined in the GSU Student Handbook. The University's academic honesty policy will be strictly enforced. Academic dishonesty of any type will not be tolerated. **Academic dishonesty will result in the grade of an "F" on the assignment and/or in the course and/or the student may be reported to the Vice President for Academic Affairs for further action. Student's found guilty of a second offense may be indefinitely suspended from the University.** In no instance will lack of familiarity with this policy excuse the violation.

IMPORTANT DEADLINES:

Last day to add/drop this class.

Last day to withdraw from this course without refund.